

S. Dunlop M. Gerbaldi (Eds.)

Stargazers

The Contribution
of Amateurs to Astronomy



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The Contribution of Amateurs to Astronomy

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Editors' Preface

IAU Colloquium No. 98 "The Contribution of Amateurs to Astronomy" was held in Paris, at the "Chaillot-Galliera" Conference Centre, on 20–24 June, 1987. A total of 250 participants – professional and amateur astronomers – came from 27 different countries. It was the first time that such a meeting had been organized under the auspices of the International Astronomical Union, and the arrangements in Paris were made by the Société Astronomique de France, which was founded one hundred years previously by Camille Flammarion, so the 100th anniversary of the SAF was also celebrated. Nine commissions of the IAU co-sponsored the meeting; it also received support from the following associations:

AAVSO (American Association of Variable Star Observers), BAA (British Astronomical Association), IOTA (International Occultation Timing Association), SRBA (Société Royale Belge d'Astronomie).

The Chairman of the Scientific Organizing Committee was Prof. J.-C. Pecker, and the names of other members who shared in the work of organizing the Colloquium are:

Dr P. Couteau (France), Cmdr H.D. Howse (U.K.), Dr M. Gerbaldi (France), Prof. J. Kleczek (Czechoslovakia), Dr I. Kozai (Japan), Dr J. Mattei (U.S.A.), Dr S. Nakano (Japan), Dr G. Taylor (U.K.), Dr V. Trimble (U.S.A.)

The Chairman of the Local Organizing Committee was Dr P. Simon, the then President of the SAF, who organized all the events in Paris, helped by P. de la Cotardière and A. Chenevez.

The proceedings were conducted in French and English and the 12 sessions were chaired by:

A.C. Levasseur-Regourd (Session 11), A. Koeckelenbergh (12), S. Debarbat (21), J. Kleczek (22), J. Mattei (23), J.-C. Merlin (24), P. Maley (25), F. Wood (26), I. Garcia de la Rosa (27), J. Rösch (31), Y. Dargery (32), A. Acker (33).

A total of 128 invited and contributed communications were given, and these *Proceedings* "espèrent refléter ces débats".

This Colloquium highlighted the fact that in several domains (most especially those of comets, variable stars, novae, etc.) the amateur contribution is becoming "irremplaçable". A second fact that became very clear is the important role played by amateurs in popularizing astronomy. In addition, this Colloquium emphasized how strong and efficient the links between professional and amateur astronomers can be.

It can justifiably be said that “Ce colloque est une grande première, couronnée de succès.”

This Colloquium's *Proceedings* differ from those of its predecessors in several ways. As editors we were faced with the usual dilemma of whether to publish an incomplete volume or to delay publication by waiting for late papers and chasing them. We adopted the second method (for various reasons) and apologize to those authors who supplied their papers “at the right time”. Not the least of our problems was the impossibility of publishing all 128 contributions in full, in English. As approximately half the contributions were in French, such a step would have involved a great deal of time and labour in translation, as well as resulting in a large book that would be far too expensive for most of the intended readers to afford. We have therefore ensured that most coverage has been given to those papers that detail new methods of observation, significant results of amateur work or amateur/professional cooperation, or that make suggestions for future research projects. A few papers have been withdrawn by their authors, for various reasons, such as a similar item having been previously published elsewhere. All other contributions are, however, included in at least abstract form and, where possible, appropriate references have been given. The majority of the abstracts are new, being rewritten to reflect the material that was actually presented at the Colloquium.

In compiling this record of the proceedings of the Colloquium we have not followed the chronological sequence in detail. For reasons of space, no posters are included. All the contributions are being published in full, in French, in special issues of the ‘Observations et Travaux’ of the Société Astronomique de France. Even where we have had to include shorter versions or abstracts in this volume, the full text submitted by many contributors has greatly helped us in editing the material or writing new abstracts. In those instances where no material was submitted by the author, the abstracts published in the original programme have been used as a basis for the reports. In a few cases where an author's mother tongue was neither French nor English, we have taken the liberty of editing the material to ensure that it is readily comprehensible. In those contributions that make reference to specific books we have, where possible, given details of English-language editions.

The translation of the contributions into English has been undertaken by one of us (S.D.), who would like to thank Mr Peter Hingley, Librarian of the Royal Astronomical Society, for his assistance in checking and locating specific references and publications in various languages.

Regrettably, it did not prove possible to use much of the material that was submitted in nominally ‘camera-ready’ form. We are therefore particularly grateful to Mme C. Boillet of the Institut d'Astrophysique de Paris for retyping many contributions. We should also like to record our thanks to André Chenevez, Philippe de la Cotardière, Derek McNally, Jean-Claude Pecker and Paul Simon for their helpful discussion of various matters relating to the publication of these *Proceedings*.

Finally, it remains for us to thank the sponsoring organisations and the various individuals involved with the Colloquium. First, we acknowledge the help of the IAU in the form of a grant to the SAF to support the Colloquium. The SAF itself financed the organization of the Colloquium.

We thank Prof. Maurice Lévy, Président of the Cité des Sciences et de l'Industrie for his welcome, as well as for the free planetarium show and visit to the Cité that he arranged for participants.

We thank all the astronomers of the Observatoire de Meudon, who organized the visit by Colloquium participants to the observatory, and who acted as guides to the equipment and facilities. We are also grateful to the Observatory for arranging for the closing dinner to be held there.

We similarly thank the Président of the Observatoire de Paris, Dr P. Charvin for the welcome to the observatory and the cocktail party given to Colloquium participants, and to astronomers of the Observatoire de Paris who guided the visitors round the "Carte du Ciel" exhibition organized by the observatory. Our thanks are also due to Madame Aurillac, Conseiller de Paris, for her welcome at the reception held at the Hôtel de Paris.

Together with the Société de la Tour Eiffel, the SAF organized the first international exhibition for amateur astronomers, and our thanks also go to M Arrivetz and the Société Imprimerie Spéciale de Banque, Paris for their sponsorship in the form of the printing of various items for the Colloquium.

We are grateful to all the persons who participated in the secretarial work involved with the Colloquium, mailed material to the participants, ran the registration desk, projected the occasional slide, etc.: Mmes Blomme, Bousquet, Caillat, Duval, Hedreul, Meriot, Naddeo, Pierron, and Regnault; Mlles Lericque and Marigny; MM Fournon, Louis-Tisserand, Pezzana, Valls-Gabaud, and Zimmermann. We are grateful to Mme Delmas who has helped us in many respects.

But, in fact, all these efforts were orchestrated by the Société Astronomique de France, without whom nothing could have been realized.

Michèle Gerbaldi, I.A.P., Paris
Storm Dunlop, Chichester

Introductory Address

Prof. J.-C. Pecker

Chairman of the Scientific Organizing Committee

Ladies and Gentlemen, Colleagues,

Astronomy only became a profession late in history. The existence of the profession of astronomer can be dated from the 17th century and the creation of the observatories at Greenwich, at Paris, and elsewhere. According to its statute of 1699, the Académie de Sciences (in Paris) had an astronomical section consisting of three members. We should note that it had decided, at the time of its foundation by Colbert in 1666, to debar astrology, which was still respected in the previous century, from being considered among the true sciences.

Until then, the great names in astronomy had lived on their own private incomes, or even on the taxes that they raised, like Tycho Brahe; or on the sale of horoscopes, like Kepler; or from their ecclesiastical income, like Copernicus. If they found a rich protector, it was he who financed everything and who gained the glory, even to the point of giving his name to catalogues: we may recall the 13th-century Alphonsine Tables in Spain, or Kepler's Rudolphine Tables.

But even after there were functioning observatories, their incumbents remained "amateurs", and only rarely dipped into the royal purse in order to carry out their astronomical duties.

And – in an essentially continuous fashion – running parallel to the research carried out by the professionals in their observatories, numerous amateur astronomers carried out observations and calculations at a comparable level of sophistication.

This parallel development naturally ceased with the appearance of very large instruments: how could amateurs rival Palomar or even Saint-Michel? But observing time on large instruments is expensive and is only given parsimoniously; so much so that for professionals the advent of giant telescopes meant that certain types of research had to be abandoned. Long-period variable stars? Finished. Systematic research about comets or asteroids? You don't get enough publications out of that, etc. In short, a new niche became obvious, twenty or thirty years ago, for amateur astronomers again to contribute to the progress of scientific knowledge, on the same terms as professionals. Having thus become, once again, "honorary astronomers" – a term that perhaps describes their activity better than any other – they are very numerous and found all over the world. Their relations with professionals, often even in the heart of the International Astronomical Union itself, have become more

regular and more confident. It is now a question of working relationships, and many honorary astronomers are now contributing to the development of our science and work in the major observatories and university laboratories.

It therefore seemed that the time had come for a major conference, a major colloquium, to be devoted to this new symbiosis. In France, the Société Astronomique de France plays a primary role in this symbiosis – does not its Council include among the amateur astronomers a considerable number of professionals? Founded in 1887 by Camille Flammarion, it is celebrating its centenary this year. It was an ideal occasion; and the Scientific Committee would like to express its best wishes to this youthful “old lady” for a wonderful second century. The following associations joined with the SAF in acting as god-parents for this colloquium: the American Association of Variable Star Observers, the British Astronomical Association, the International Occultation Timing Association, and the Société Royale Belge d’Astronomie.

For the benefit of English-speaking participants, I shall first comment on this obviously French word, “amateur”, which unites us today. I have mentioned that in French, as in English, the word has a bad connotation, but a wrong one: amateur astronomers are of course not amateurish, indeed they do *love* astronomy, as the French word also has this meaning (to love: aimer, in French). That is certainly what we all have in common, our love for the things of the sky, our enthusiasm for celestial spectacles, from eclipses to supernovae, from comets to occultations, our great happiness in understanding these marvels, our passion for the Sun, the stars, the Galaxy. Love indeed.

Many people, guided by this love for astronomy, are here today, coming from all parts of the world. I ask them to be indulgent to us. Not only because this meeting was difficult to organize; you may find flaws; I hope you will pardon us for them. Often also, we shall speak French, as much as English. It is of course easier to express oneself in one’s own language. It would be better still if all of us were able to speak the twenty languages spoken in this room... English and French are the statutory working languages of the IAU – hence we have limited the linguistic scope to these two – with apologies to the others!

The International Astronomical Union has agreed to this meeting being an IAU Colloquium, number 98. I am grateful to the Executive Committees that gave such a warm welcome to our proposal, just as I thank the Presidents of ten IAU Commissions that agreed to support this project. Their suggestions resulted in the formation of the Scientific Organizing Committee, to the members of which I express my grateful thanks for their invaluable help and advice.

But I must not delay the scientific talks and discussions, which I also await with great impatience. Thank you all for coming and for your participation. I am certain that this meeting will result in many new relationships, and fertile and promising friendships.

Bienvenue et bon travail!

Welcome!

Table of Contents

Part I Historical

Amateur Astronomy from Its Origins to Camille Flammarion	
<i>J. Seidengart</i>	2
Camille Flammarion (1842–1925): Founder of the Société Astronomique de France	
<i>J. Pernet</i>	11
The Historical Contribution of Amateurs to the Study of Double Stars	
<i>P. Couteau</i>	15
Twentieth-Century Amateur Astronomy	
<i>A.J. Meadows</i>	20
Criteria for Identifying an Astronomer as an Amateur	
<i>T.R. Williams</i>	24
Johannes Hevelius: Polish Seventeenth-Century Brewer and Astronomer	
<i>C. Iwaniszewska</i>	26
Eugène Antoniadi (1870–1944) and Planetary Observation	
<i>A. Dollfus</i>	28
Investigating Astronomy's History	
<i>N. Sperling</i>	31
Charles Boyer and the Rotation of Venus	
<i>A. Dollfus</i>	32
The Amateur and Eclipsing Binary Stars	
<i>F.B. Wood</i>	35
Amateur Astronomy in Poland: Past and Present	
<i>K. Turaj</i>	40
Giovanni Battista Lacchini: An Amateur Astronomer from Italy	
<i>G. Favero, S. Baroni</i>	44
The Instruments of H.E. Dall	
<i>E.J. Hysom</i>	46
Roberts of Lovedale and Eclipsing Binary Stars	
<i>T.R. Williams</i>	48
	XI

Seventeenth-Century Solar Observations: Fundamental Results with Amateur Instruments	
<i>E. Ribes-Nesme, J.C. Ribes</i>	50
Sailors and Astronomy	
<i>A. Demerliac</i>	51
The Map of the Heavens at the Chateau de Saint-Jean-de-Chepy	
<i>J. Barbier</i>	54
Amateur Astronomy in France, 1789–1830: Two Examples	
<i>S. Dumont, S. Grillet</i>	55
Some French Amateurs of the 2nd Half of the 19th Century	
<i>F. Hourmat</i>	56
Comet Halley in 1910 in Franche-Comté: or Collective Memory at Fault	
<i>A. Heurtel, M. Rougeot, J.P. Parisot</i>	57
A Renowned, Yet Forgotten Astronomer: Marcel de Kerolys	
<i>A. Richardot</i>	58
Historical Session: The Contribution of Amateurs to Astronomy, Yesterday and Today	
<i>A. Koeckelenbergh</i>	62

Part II Observational Methods

Amateur Astronomers and the IAU Central Bureau for Astronomical Telegrams and Minor Planet Center	
<i>B.G. Marsden</i>	64
Contributions of Amateur Astronomers to Variable-Star Observing	
<i>J.A. Mattei</i>	77
Observations of Comets, Minor Planets and Meteors in Japan	
<i>I. Hasegawa</i>	87
Amateur Astronomers' Contribution to the HIPPARCHOS Programme	
<i>P. Bacchus</i>	90
The S.A.F. Double Star Section's Contribution to the INCA-HIPPARCHOS Programme	
<i>P. Durand</i>	93
Working with Amateur Astronomers	
<i>S.J. Edberg</i>	95
Amateur Astronomers and the Hubble Space Telescope	
<i>S.J. Edberg</i>	100
The T.60 Operation at Pic du Midi	
<i>C. Buil, O. Las Vergnas</i>	102
The Effects of Light Pollution on Amateur Astronomy	
<i>D. Crawford</i>	104
An Amateur CCD Camera	
<i>C. Buil, G. Prat, E. Thouvenot</i>	105

A Spectrograph for the T.60 at Pic du Midi	
<i>D. Bardin, D. Buty</i>	108
Using an Image-Intensifier in Astronomy	
<i>T. Midavaine</i>	110
Amateur Polarimetric Research	
<i>D. Böhme</i>	110
Searching for Variables, and Constructing a Slit-less Spectroscope	
<i>L. Dahlmark</i>	111
Solar Spectroscopy with a CCD	
<i>O. Saint-Pé</i>	111
Obtaining Extraterrestrial Dust by Balloon Probes	
<i>L. Baufette</i>	111
Making a Telescope Mirror	
<i>J.M. Becker</i>	112
Searching for Comets	
<i>B. Mayer</i>	112
Achievements in Astronomical Video Data Collection	
<i>P.D. Maley</i>	113
Video Grazing Occultations	
<i>D.W. Dunham</i>	120
An Improved Method of Photographic Measures of Double Stars	
<i>D. Rodriguez, J.A. Bernedo, D. Valls-Gabaud</i>	122
The Scientific Merit of Amateur Astrophotography	
<i>W.E. Celnik, P. Riepe</i>	128
Reduction of Variable-Star Observations Using Basicode	
<i>T. Jurriens</i>	131
Image Digitizer	
<i>P.A. Magnien</i>	133
“Comet” Software	
<i>P. Butzbach, J.P. Parisot</i>	133
Refining the Orbit of Visual Double Stars	
<i>E. Soulie</i>	133
Reliability and Accuracy of Astronomical Observations by Amateurs	
<i>Z. Kviz</i>	134
Trying to Reduce Errors in Visual Estimates of Variable Star Magnitudes	
<i>E. Velasco, P. Velasco</i>	138

Part III Observations and Results

Photographic Observation of Stellar Occultations	
<i>A. Tomić, N. Čabrić, V. Čelebonović</i>	144
Studying “Luna Incognita”: The Region Near the South Pole	
<i>M. Legrand</i>	146

Asteroid and Cometary Occultations	
<i>D.W. Dunham</i>	147
Astrometric Measurements of Rarely-Observed Minor Planets	
<i>R. Chanal</i>	149
Video Recordings of Asteroidal Occultations	
<i>R. Boninsegna, J. Lecacheux</i>	149
Space Exploration of Comets and the Evolution of Amateur-Professional Cooperation	
<i>A.-C. Levasseur-Regourd</i>	150
The Contribution of Amateur Astronomers to Cometary Observation	
<i>A. Heck</i>	152
New Method of Statistical Analysis of Cometary Light-Curves Applied to P/Halley	
<i>S. Thebault</i>	153
P/Halley: The Disconnection Event of 1986 April 11	
<i>P.M. Bergé, G. Mahoux, A.C. Levasseur-Regourd</i>	155
A Study of Disconnection Velocities in the Plasma Tail of P/Halley	
<i>R. Caron, S. Koutchmy, M. Sarrazin</i>	158
Analysis of the Light-Curve of Comet P/Halley in 1985–1986	
<i>D. Valls-Gabaud, A. Gómez</i>	160
New Trends in the Discovery of Comets by Amateurs	
<i>J.C. Merlin</i>	163
Amateur Astronomers and the Recovery of Periodic Comets	
<i>P. Martinez</i>	163
Shape and Frequency of Outbursts of P/Schwassmann-Wachmann 1	
<i>J.C. Merlin, D. Fayard, E. Gérard</i>	164
Astrometry of Comet Halley	
<i>H. Hadavi</i>	164
Observation and Analysis of Comet Tails	
<i>R.L.W. van de Weg</i>	164
Photometric Analysis of the Solar Corona on 1984 November 22/23	
<i>R. Caron, Ch. Nitscheim, M. Sarrazin</i>	166
Chromospheric Eruptions Observed with a Wide Slit	
<i>F. Costard</i>	168
Amateur/Professional Cooperation in 2 Solar Studies	
<i>T. Roudier, R. Muller, J.C. Hulot, F. Vaissière</i>	168
The IOTA Expedition Results from the Total-Annular Eclipse in Gabon, 1987	
<i>P.D. Maley</i>	169
Meteor Studies	
<i>B.A. Lindblad</i>	170
The “Sonate” Campaign	
<i>J. Mazel, R. Futaully</i>	173
Two Solar Observation Programmes	
<i>M.J. Marthes, J.M. Malherbe, J. Vial</i>	175

Long-term Monitoring of Solar Activity by Amateur Astronomers	
<i>K. Reinsch</i>	177
The Moonwatch Program: A Model for Amateur Contributions to the ISY	
<i>J. Cornell</i>	181
Study of Variable Stars	
<i>E. Poretti</i>	183
The Contribution of Amateur Astronomers to the Study of Variable Stars	
<i>D. Proust, E. Schweitzer</i>	185
Professional/Amateur Cooperation in the Study of Variable Stars as Illustrated by the Fourth Edition of the GCVS	
<i>M.S. Frolov</i>	188
Amateurs and the Search for Supenovae	
<i>S.H. Lucas</i>	190
The U.K. Nova/Supernova Search Programme	
<i>G.M. Hurst</i>	192
GEOS – Groupe Européen d’Observations Stellaires	
<i>M. Dumont</i>	194
GEOS Results for PX Cephei	
<i>R. Boninsegni</i>	196
The French Network for Observing Comets and Small Solar-System Bodies	
<i>R. Chemin</i>	197
Amateurs’ Contribution to the PHEMU85 Campaign Observing Mutual Phenomena of Jupiter’s Satellites	
<i>J.E. Arlot</i>	198
Wanted: An International Jovian-Satellite-Phenomenon Centre	
<i>N.P. Wieth-Knudsen</i>	199
The European Section of IOTA: Scientific Programme Coordination and Results	
<i>W. Breisker, H.J. Bode</i>	199
The Role of the Amateur in Modern Astronomy	
<i>H.D. Howse, P. Moore</i>	200

Part IV Popularization

Meeting the Public: Popular Observatories	
<i>J. Kleczek</i>	202
Comet Halley: A Media Event	
<i>J.-L. Heudier</i>	205
A Planetarium for Astronomy	
<i>A. Acker</i>	208
Astronomical Publications	
<i>P. de la Cotardière</i>	210
Problems in Publishing a Popular Journal in a Small Country	
<i>P. Gugnon, J. Sauval</i>	213

Methods of Popularizing Astronomy in Various Countries	
<i>C. Iwaniszewska</i>	214
Opening the Sky to Everyone	
<i>J. Chanoir</i>	215
Interesting Business in Astronomy	
<i>M.L. du Moutier</i>	215
Preparing Astronomical Videotapes	
<i>F. Suagher et al.</i>	216
Transmission of Astronomical Data and Information by the A.F.A. Videotext System	
<i>B. Pellequer</i>	216
The Solar System Promenade	
<i>A. Tarnutzer</i>	216
The Open Sky Underground	
<i>I. Beauvois, O. Las Vergnas</i>	217
Teaching Astronomy in Schools	
<i>C. Iwaniszewska</i>	217
Teaching Astronomy and the Vital Role of the True Amateur	
<i>H.R. Mills</i>	217
Astronomical Education in Poland	
<i>K. Turaj</i>	218
Astronomy and Computing in Spanish (Aragon) High Schools	
<i>A. Elipe, J. Ezpeleta, V. Lanchares</i>	218
The Planetarium at the Palais de la Découverte	
<i>G. Oudenot</i>	218
The Starlab Mobile Planetarium in the Mid-Pyrenees	
<i>J.-P. Chrétien, J.-P. Brunet</i>	219
The Planetarium at a School in Nice	
<i>J. Chappelet</i>	219
The Planetarium as a Medium for Teaching Astronomy	
<i>K. Barve</i>	219
Twenty Years of the Japan Amateur Astronomers' Convention	
<i>S. Kimura</i>	220
Astronomy in the Big Apple	
<i>J. Pazmino</i>	220
The Activities of Astronomical Clubs	
<i>C. Bourdeille</i>	220
The Flammarion Astronomical Society of Montpellier	
<i>J.-M. Faidit</i>	221
A Decade of Organized Work in Venezuela	
<i>D. Sanchez</i>	221
The Bochum Observatory	
<i>J.V. Feitzinger et al.</i>	221
The Triel Observatory	
<i>J.-P. Trachier</i>	222

The Bruno-H.-Bürgel Observatory	
<i>H. Busch</i>	222
The Strasbourg Observatory	
<i>R. Hellot</i>	222
Feeding the Five Thousand	
<i>M. Enock</i>	223
Efforts by the Instituto de Astrofísica de Canarias to Publicise Astronomy	
<i>I. García de la Rosa et al.</i>	223
Tailor-Made Messages: Astronomical Information for Diverse Audiences	
<i>J. Cornell</i>	223
The Role of the Observatoire de Paris, Meudon in Providing Astronomical Information	
<i>M. Floquet, B. Schmieder</i>	224
Observations – Concluding Remarks	
<i>B.G. Marsden</i>	225
International Astronomical Union – Colloquium 98 General Session	
<i>A. Koeckelenbergh</i>	228
<i>List of Participants</i>	231

Historical

Amateur Astronomy from Its Origins to Camille Flammarion

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Introduction

It is not possible to sketch the history of astronomy by amateurs without first defining what the term “amateur astronomer” truly means. But we must avoid using “the benefit of hind-sight” to interpret the past in terms of a concept, the relevance of which has been perceived only during the course of the last one hundred years. In order to avoid the sophistry arising from such a purely imaginary history that is based on false conceptions, it is useful to examine amateur astronomy’s precise status, since its emergence in the dawn of classical science, by outlining the type of relationship that it has had with “professional” astronomy. In doing so, we can evoke some of the major developments in amateur astronomy, the scientific contributions of which, although often of high quality, have at times reached the very forefront of the discipline of astronomy.

In early classical French, the term “amateur” referred to anyone who had a keen interest in the arts, being based primarily on the strong love that could arise for any object capable of stirring the emotion. In the course of the 17th century, the term came to be extended to cover the sciences and other fields in general. An amateur is therefore, above all, anyone who does not live by astronomy – disregarding how meagre the income of official astronomers may have been in the past. From this we may see that it has to be one thing or the other: either amateurs gain their income from some other professional activity – but they are then unable to devote their whole time to astronomy – or else they are sufficiently rich to be able to give their undivided attention to their love. In the latter case, however, they risk being just a “dilettante” (that is to say no more than a “curiosity-seeker”, who is only drawn by what is unusual or new); a dilettante, moreover, whose practice of astronomy is influenced more by inclination than by the exigencies of a plan of research that has been methodically and rationally devised within an overall cooperative programme. Dilettantes are not forced to preserve any continuity in their observational programmes, the content of which may vary according to the whim of the moment.

Amateurs, therefore, have less time at their disposal than professionals, or else work in a very disjointed fashion. In most cases their initial theoretical grounding is much shallower and less technical than that of professionals, even if these same amateurs have often been professional scientists in other disciplines (mathematics,